

The Invention Claimed Is

1. An instrument for creating an aperture through a side wall of a patient's tubular body organ structure at a point along that structure which is remote from the location at which the instrument is inserted into said tubular structure and from which the instrument is controlled comprising:

an elongated guide structure longitudinally insertable into said tubular structure at said location and extendable along the interior of said tubular structure to said point; and

a longitudinal structure substantially aligned with and guided by said guide structure and longitudinally movable relative thereto, a distal portion of said longitudinal structure being adapted to penetrate said side wall when forced against said side wall by a sufficient amount of distal motion of said longitudinal structure relative to said guide structure.

2. The apparatus defined in claim 1 wherein said guide structure includes an expandable structure for stabilizing said guide structure in said tubular structure.

3. The apparatus defined in claim 2 wherein said expandable structure comprises an inflatable balloon.

4. The apparatus defined in claim 3 wherein said balloon is a perfusion balloon.

5. The apparatus defined in claim 1 wherein said guide structure has a distal portion adapted to deflect said distal portion of said longitudinal structure laterally toward said side wall.

6. The apparatus defined in claim 1 wherein said guide structure has a distal portion which includes a laterally expandable structure for urging said distal portion of said guide structure into contact with said side wall.

7. The apparatus defined in claim 6 wherein said laterally expandable structure comprises an inflatable balloon.

8. The apparatus defined in claim 7 wherein said balloon is a perfusion balloon.

9. The apparatus defined in claim 6 wherein said laterally expandable structure is disposed on a first lateral side of said distal portion of said guide structure, and wherein said distal portion of said guide structure is adapted to deflect said distal portion of said longitudinal structure laterally toward a second lateral side of said distal portion which faces away from said first lateral side.

10. The apparatus defined in claim 1 wherein said guide structure comprises:

a radiologic marker on a distal portion of said guide structure.

11. The apparatus defined in claim 1 wherein said guide structure comprises a tube through which said longitudinal structure extends longitudinally.

12. The apparatus defined in claim 1 further comprising:

a tube longitudinally insertable into said tubular structure at said location and extendable along the interior of said tubular structure to an intermediate location which is between said location and said point, said guide structure being longitudinally insertable through said tube.

13. The apparatus defined in claim 1 wherein said distal portion of said longitudinal structure, is sharpened to facilitate penetration of said side wall.

14. The apparatus defined in claim 1 wherein said distal portion of said longitudinal structure is externally threaded to facilitate penetration of said side wall when said distal portion of said longitudinal structure is rotated about its longitudinal axis.

15. The apparatus defined in claim 1 wherein said distal portion of said longitudinal structure is resiliently biased to deflect laterally toward said side wall when released from guidance by said guide structure.

16. The apparatus defined in claim 1 wherein said distal portion of said longitudinal structure comprises:

a substantially central longitudinal member having a distal portion which is adapted to make an initial penetration of said side wall; and

a tubular member disposed substantially concentrically about said central member and longitudinally movable relative thereto for circumferentially enlarging said initial penetration when forced through said side wall after said central longitudinal member has made said initial penetration.

17. The apparatus defined in claim 16 wherein said tubular member is externally threaded to facilitate passage of said tubular member through said side wall when said tubular member is rotated about its longitudinal axis.

18. The apparatus defined in claim 1 wherein said distal portion of said longitudinal structure comprises:

a tubular member insertable through said aperture, said tubular member having a selectively enlargeable structure disposed on its exterior at a predetermined distance proximally from its distal end for selectively preventing more than the portion of said tubular member which is distal of said enlargeable structure from passing out of said tubular structure via said aperture.

19. The apparatus defined in claim 18 wherein said enlargeable structure comprises an inflatable balloon.

20. The apparatus defined in claim 19 wherein said balloon extends annularly around the

exterior of said tubular member and projects radially outwardly from said tubular member in all radially outward directions when inflated.

21. The apparatus defined in claim 1 wherein said distal portion of said longitudinal structure comprises:

a tubular member insertable through said aperture, said tubular member having a selectively enlargeable structure disposed on its exterior at a predetermined distance proximally from its distal end for selectively preventing the portion of said tubular member which is distal of said enlargeable structure from moving proximally back through said aperture.

22. The apparatus defined in claim 21 wherein said enlargeable structure comprises an inflatable balloon.

23. The apparatus defined in claim 22 wherein said balloon extends annularly around the exterior of said tubular member and projects radially outwardly from said tubular member in all radially outward directions when inflated.

24. The apparatus defined in claim 1 wherein said distal portion of said longitudinal structure comprises:

a tubular member insertable through said aperture, said tubular member having first and second selectively inflatable balloons disposed on the exterior thereof, said balloons being spaced from one another along the longitudinal axis of said tubular member, and each of said balloons extending annularly

around said tubular member so that each of said balloons forms an enlarged ring around the outside of said tubular member when inflated, the spacing between said balloons being such that said first and second balloons can be located adjacent respective interior and exterior surfaces of said side wall when said tubular member is inserted through said apertures.

25. The apparatus defined in claim 24 wherein said spacing between said balloons is further such that said balloons resiliently compress said side wall between them when inflated.

26. The apparatus defined in claim 24 wherein said balloons substantially prevent longitudinal motion of said tubular member through said aperture when inflated.

27. The apparatus defined in claim 24 wherein said balloons help to prevent fluid leakage through said aperture around said tubular member when inflated.